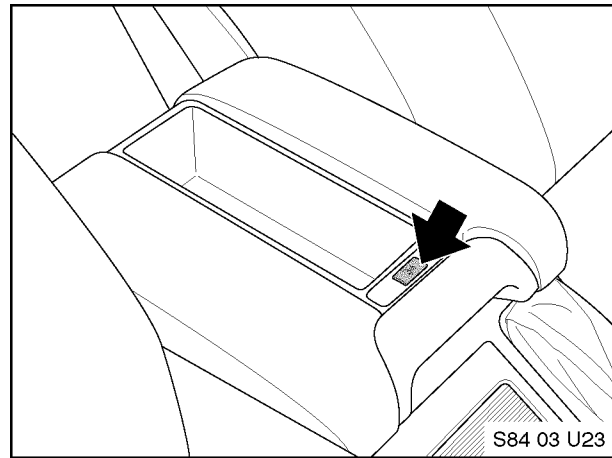# Table of Contents

BMW Universal Bluetooth™

BMW Universal Bluetooth™

Introduction

The BMW Universal Bluetooth™ Hands-Free System (ULF) utilizes Bluetooth™ wireless technology to enable a wireless connection to be established between a Bluetooth™ enabled mobile phone and the ULF Control Module installed in the vehicle. The combination of these components results in a new generation of in-vehicle phone system.

The ULF Control Module forms an interface that allows a mobile phone with the embedded Bluetooth™ wireless technology feature to be wirelessly integrated into the vehicle.

5 Series (E39) - With Oddment Tray

For the first time BMW is introducing a new generation hands-free telephone system kit that provides the customer with the option of using various Bluetooth™ enabled mobile phones (a list of recommended phones is available from your BMW Center).

What is Bluetooth™?

The name Bluetooth™ is derived from the Danish King Harald Bluetooth who lived in the 10th century. He was well known for his ability to unify his kingdom and today lends his name to a wireless technology standard that can connect/unify various electronic devices that are Bluetooth™ enabled and located within a short range (approx. 10 m or 32.8 ft) of each other.

Bluetooth™ wireless technology is a short-range radio frequency technology standard that allows several devices to communicate with each other simultaneously. The standard indicates that up to seven simultaneous connections can be established and maintained at one time, as long as the connected devices are within a range of 10 m (32.8 ft).

Note: The ULF system will allow four phones to be paired to the system at a time and only allow one phone to be connected at a time.

Communication/Security

The system uses the license-free, global Industrial Scientific Medical band (ISM) at 2.45 GHz. This frequency range from 2.402 GHz to 2.480 GHz is subdivided into 79 channels with a 1 MHz bandwidth.

Signals transmitted through the airways can be scrambled and unscrambled to enhance communication security. With Bluetooth™ technology, communication frequencies are changed 1600 times per second to reduce the risk of interference or interception of the transmitted signal. The relatively small operating range of approx. 10 m (32.8 ft) also enhances the security of this technology, since tampering with the transmitted data is only possible when inside the 10 m (32.8 ft) wireless "network".

To further enhance the security of this short-range wireless network the ULF system requires a pairing procedure to be carried out for each device that will be introduced into the network. As part of this procedure a required passkey must be entered once (during the initial pairing procedure) to establish a secure connection between the phone and the ULF Control Module.

Data and Voice

Bluetooth™ was developed for the transmission of both voice as well as data. A bandwidth of approx. 1 MB/s is available for this purpose.

Bluetooth™ Enabled Phones

Ideally all phones that are Bluetooth™ enabled should work with the ULF system, however er not all phones utilize the same profiles and therefore may not be recognized by the ULF System. A list of recommended Bluetooth™ enabled phones is available from your BMW Center.

Advantages of the ULF System

- Once a phone is paired to the system it will be able to automatically connect to the Bluetooth™ wireless network of the vehicle, the next time it is introduced into the vehicle and the vehicle ignition is on.

- Up to four different Bluetooth™ phones can be paired to the system at one time, although only one phone can be wirelessly connected at any time.

- The phone does not need to be inserted into a phone specific cradle in order to be integrated into the vehicle.

- The phone can remain in a briefcase, purse, glove box, etc.; as long as it is turned on and located within the interior of the vehicle.

- The MFL buttons on the steering wheel can be utilized to place or receive a call, to scroll the phone book and select a number or activate voice recognition in order to dial a number via voice command.

- A voice recognition system is integrated into the ULF control module and can be activated by depressing the send/receive [icon] button.

- The communications protocol of Bluetooth™ wireless technology is standardized irrespective of the manufacturer, this therefore allows various mobile telephones that utilize Bluetooth™ wireless technology and a recognized profile to be connected to the ULF System.

System Overview

A ULF system consists of a control module, microphone, Bluetooth™ antenna, a stand-alone pairing (send/receive) button, or eject box with a coin tray insert.

ULF System Overview

BMW BUSINESS CD   BT PAIRING   RDS**PTY

OR

S34 03 31

ULF Control Module

The ULF module forms the interface between the Bluetooth™ mobile phone and the electronic system in the vehicle. The mobile phone with the embedded Bluetooth™ wireless technology is the transceiver, this requires that the phone be activated, paired and present within the vehicle network in order to place or receive a call in the vehicle.

Oddment Tray

The oddment tray, which is connected to the ULF control module via the vehicles wiring harness, serves the purpose of:

Housing the send/receive ⬚ or pairing button, which must be depressed to activate the pairing procedure between the phone and the control module.

S84 03 U23
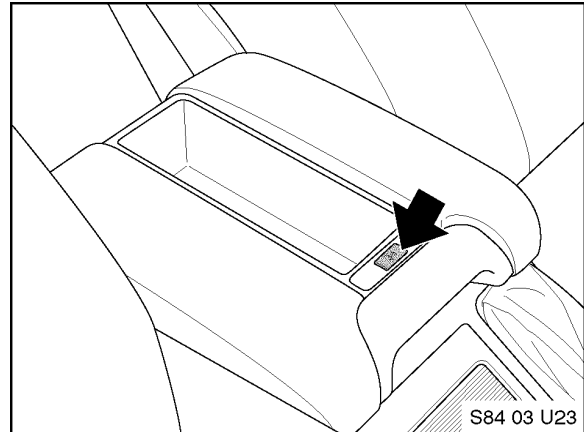
Pairing Button

A stand-alone send/receive ⬚ or pairing button is supplied for the 3 Series in order to retain the cup holders. The button provides the same function as the send/receive ⬚ button on the steering wheel, plus is the button that must be depressed to activate the pairing procedure between the phone and the control module.

S84 03 U29
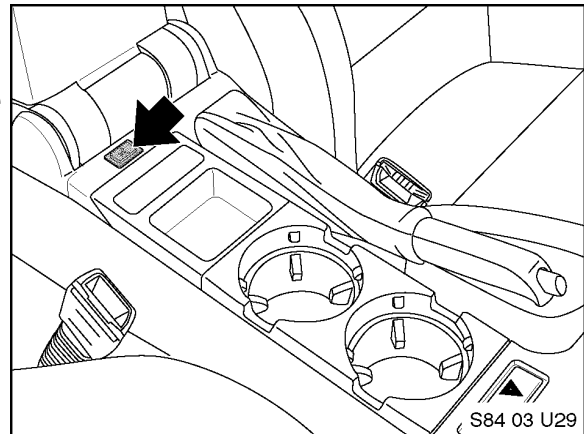
Bluetooth™ Antenna

The Bluetooth™ antenna operates on a frequency of 2.45 GHZ and is installed in the interior compartment of the vehicle. This antenna provides the wireless interface between the Bluetooth™ enabled phone and the ULF Control Module.

System Operation

Initial Operation

Prior to using the system for the first time, the Bluetooth™ mobile phone that is to be used must be paired with the ULF control module. This pairing procedure is necessary in order to assign the digital code of the mobile phone to the ULF control module installed in the vehicle. The pairing procedure is only required when a new phone is introduced to the ULF system for the very first time or the list of paired devices is cleared form the memory of the ULF module, it does not need to be performed every time the phone is used with the system.

After pairing, the mobile phone is recognized automatically by the ULF control module within 45 seconds after it is introduced into the vehicle and the ignition is turned on.

Note: Depending on the mobile phone manufacturer, particular care must be taken prior to initial operation to ensure that no headset is coupled with the mobile phone. Various devices may interpret the ULF control module as a headset and request deactivation of the headset. Please refer to the operating instructions of the mobile phone for detailed information.

Pairing Procedure

The pairing procedure that must be initiated through the phone will differ corresponding to the different menu configurations of the various Bluetooth™ mobile phones on the market. The user's manual of the phone manufacturer should always be referenced for specific steps on how to activate the Bluetooth™ feature and to pair/link devices.

The following steps are generalized steps that should help in activating the Bluetooth™ function of most phones:

IN VEHICLE:

1. Depress the send /receive (pairing) button located in the center console, for at least 1 second prior to switching on the ignition and continue to hold the button down for approximately 2-3 seconds after the ignition is turned on.

2. Release the button.

    Note: The send/receive (pairing) button in 5 Series and X5 SAV is located on the oddment tray assembly in the center console.
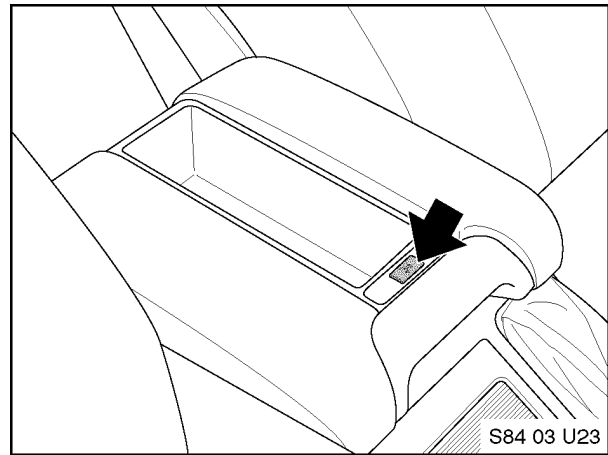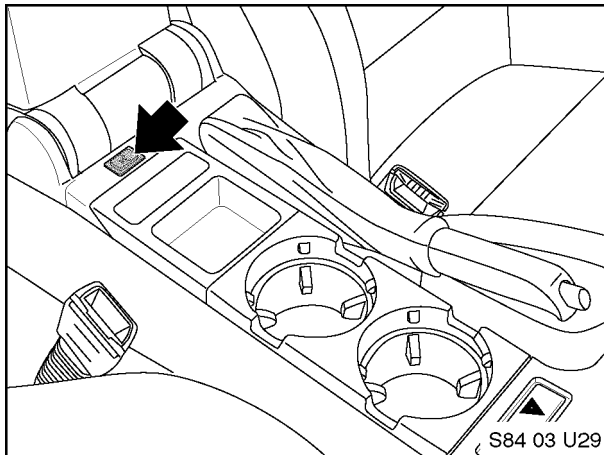
3. Shortly after releasing the button on the Radio or Display Screen, the following message should be displayed:

a. Display Screen:

"Bluetooth Pairing" displayed. Green, Yellow and Red LEDs on the right side of the unit are flashing which indicates that the ULF is waiting for a signal from the Bluetooth™ device to be paired.
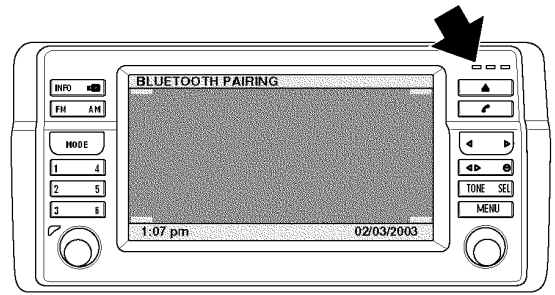
b. Radio Display (5 Series and X5 SAV)

"Bluetooth Pairing" display which indicates that the ULF is searching for available Bluetooth™ devices. Green, Yellow and Red LEDs on the right side of the unit are flashing which indicates that the ULF is waiting for a signal from the Bluetooth™ device to be paired.
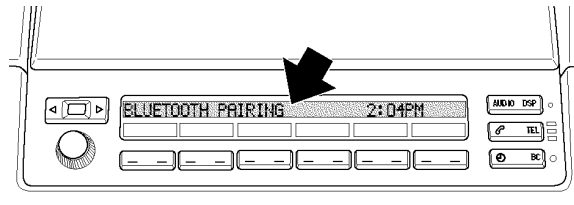
c. Radio Display (3 Series with CD or Cassette)

"BT Pairing" display which indicates that the ULF is searching for available Bluetooth™ devices.
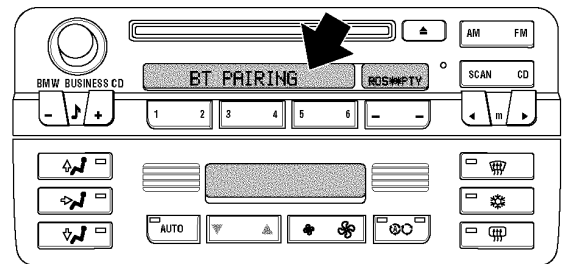
4. Activate the search function of the phone as indicated below.

ON PHONE:

1. Locate the connection/settings menu and select Bluetooth™.

2. Select the response that will activate the Bluetooth™ feature of the phone.

3. Next select a menu option that will allow you to "Discover" or "Search" for active Bluetooth™ devices.

4. If the phone identifies/finds a device (named "BMW" followed by 5 digits) select it and follow the indicated steps to complete the pairing process.

5. Once the phone is successfully paired to the device cycle the vehicle ignition switch off and back on and the devices should wirelessly connect within 30 seconds. When the connection is established the phone will display a connection symbol.

The following steps are an example of the pairing procedure that must be initiated to pair the Sony Ericsson T68i phone to the ULF Control Module.

1. Press the menu button.

2. Select "Connect".

3. Select option 3: "Bluetooth".

4. Select option 4: "Options".

5. Select option 1: "Operation mode" and set to "On" or "Automatic".

6. Go back one step by pressing the red phone button several times.

7. Select option 3: "Discover".

8. Mobile phone display shows 'Searching'

9. Select "BMW ......" in upcoming list.

10. Select option 1: "Add to paired".

11. Enter the password (= ULF passkey) located on ULF Control Module that is in the rear of the vehicle or on the Passkey Reference Card.

    - Mobile phone display shows 'BMW ...... Pairing'

    - Mobile phone display shows 'Pairing Successful'

    - Display screen shows 'Pairing succeeded' for 3 seconds

12. Enter device name or accept the name that is automatically displayed.

13. Mobile phone display shows "Added to paired devices".

14. Exit menu by pressing the red phone/NO button.

15. Once the phone is successfully paired to the device cycle the ignition switch off and back on.

16. The devices should wirelessly connect within 30 seconds. The connection is established when the phone displays the symbols indicated, on the right side of the screen.

Note: Shortly after turning on the ignition and the Bluetooth™ connection is identified, the phone may display a message asking if the connection should be established/accepted. The connection authorization request will always occur unless the setting on the phone is modified to allow automatic connection every time, please refer to the user's manual of the phone to determine how to change this setting.
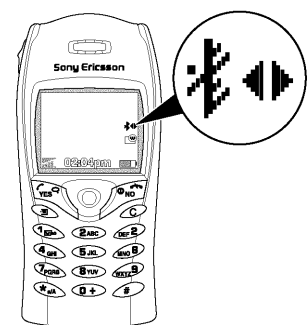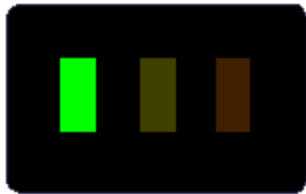
System Functions

The mobile phone must always be activated, paired and present within the Bluetooth™ network in order to place or receive a call through the vehicle.

Indicator Lamps

The indicator lamps show the following:

Active call (green light)

No mobile phone in range (steady red light)

No network (flashing red light)
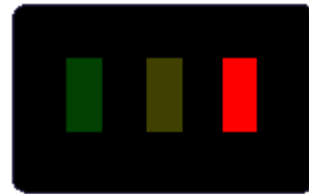
Adopting Telephone Book

Depending on the type of Bluetooth™ mobile phone, the telephone book is either transferred automatically (ex. Nokia 6310, Sony Ericsson T68i) or manually (depending on software version of phone) by the user to the ULF control module. The address book is stored temporarily for the purpose of accessing/displaying stored phonebook information using the steering wheel controls or telephone menu selections available on the display screen or some radio displays.

If a manual transfer of the address book must be made, the ULF must be in setup mode for manual transfer. The corresponding data can then be transferred. If phonebook data is modified while the phone is wirelessly connected to the vehicle the changes will not be displayed in the vehicle if the phonebook is scrolled via the steering wheel or display screen, changes will only be transferred the next time the ignition is cycled.

Placing a Call

A call can be placed in several different ways:

1. Using the keypad or address book of the mobile phone and depressing the send button on the phone.

Note: Some phones may ask if the call is to remain within the phone. Refer to the users manual of the phone for specific instructions on disabling this feature.

2. Depressing the R/T button on the steering wheel, then scrolling (using the ⬆ or ⬇ buttons) through the address book of the phone that is linked to the ULF, until the desired number is displayed on the radio or display screen and then depressing the send/receive ⬚ button on the steering wheel or center console to place the call.

3. Depressing the [icon] button on the steering wheel until an audible "beep" is heard through the vehicle speakers, at this point a call can be placed by using the following voice commands:

  - "Dial number" or "Dial phone"

  - After the system asks for a number say the number.
    Example: "123 456 7890"; the system will repeat the number requested once you stop speaking momentarily, the number may also be displayed depending on the vehicle and equipment/accessories installed.

  - "Dial"

Note: Once the dial command is given the number will be displayed on the dis play screen or radio; plus it will always be displayed on the mobile phone after a call is placed.

4. Briefly depressing the [icon] button on the steering wheel will redial the last number dialed.

For more information on using voice commands refer to the "Owner's Manual for Voice Input System. The Convenient Alternative to Manual Control" (P/N 84 11 027 942)

Receiving/Accepting a Call

The call ringer in the Bluetooth™ mobile phone is audible when an incoming call signal is received. At the same time, the signal is sent via the Bluetooth™ interface in the mobile phone to the Bluetooth™ antenna in the vehicle. The ULF receives the incoming ring/call signal via the Bluetooth™ antenna and mutes the radio. The incoming ring/tone signal is then also transmitted to the vehicle speakers.

The following options are available for accepting a call:

3 Series without Display Screen:

  - Press send/receive [icon] button on MFL (Steering Wheel)

  - Press send/receive [icon] button in the center console

  - Press send/receive key on mobile phone

5 Series and X5 SAV without Display Screen:

  - Press send/receive [icon] button on MFL (Steering Wheel)

  - Press send/receive key on radio

  - Press send/receive [icon] button on the oddment tray (Center Console)

  - Press send/receive key on mobile phone

Vehicles with Display Screen:

- Press send/receive ⬛ button on MFL (Steering Wheel)
- Press send/receive ⬛ button on the oddment tray (Center Console)
- Select the green phone symbol on the Display Screen
- Press send/receive key on mobile phone

Conducting a Call

If the call is accepted by pressing the send/receive key ⬛ on the Radio (5 series and X5 SAV), Display Screen, steering wheel or center console, it will be conducted via the hands free microphone and vehicle speakers.

If a call is accepted by pressing the send/receive key on the mobile phone, the reaction will depend on the type of handset. In the majority of cases, however, the question appears:

"Do you wish to use the mobile phone?"

Please refer to the operating instructions of the mobile phone for a detailed description of the operating procedure of the phone.

The hands-free function is activated after pressing the send/receive key. The incoming call is encoded (scrambled) via the Bluetooth™ interface in the mobile phone and sent to the Bluetooth™ antenna in the vehicle. The call is received by the ULF control module and output via the radio to the audio speakers.

Incoming Signal

| Bluetooth Mobile Phone | Bluetooth Antenna | ULF Control Module | Speaker |

S84 03 U68
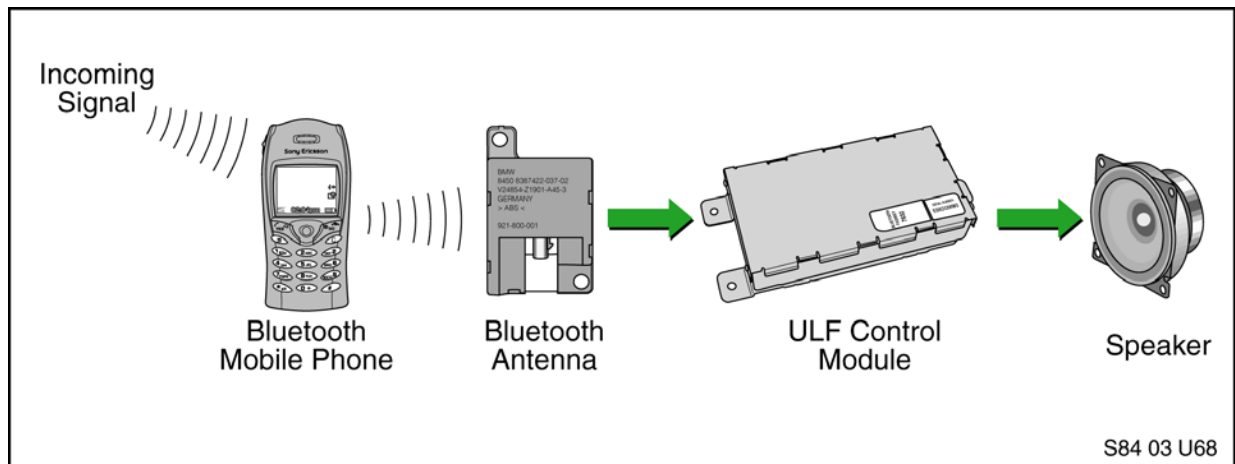
 Since the ULF system provides a digital full-duplex hands-free operation, it is possible to simultaneously speak and listen to calls. An echo cancellation function prevents feedback when speaking into the microphone. The microphone audio signal is sent via a hardwire connection to the ULF control module. In the ULF module the received audio signal is scrambled via the Bluetooth™ module and transferred via the Bluetooth™ antenna to the mobile phone. The mobile phone then transmits the call via the phone antenna.

Outgoing Signal

Microphone   ULF Control Module   Bluetooth Antenna   Bluetooth Mobile Phone

S84 03 U69
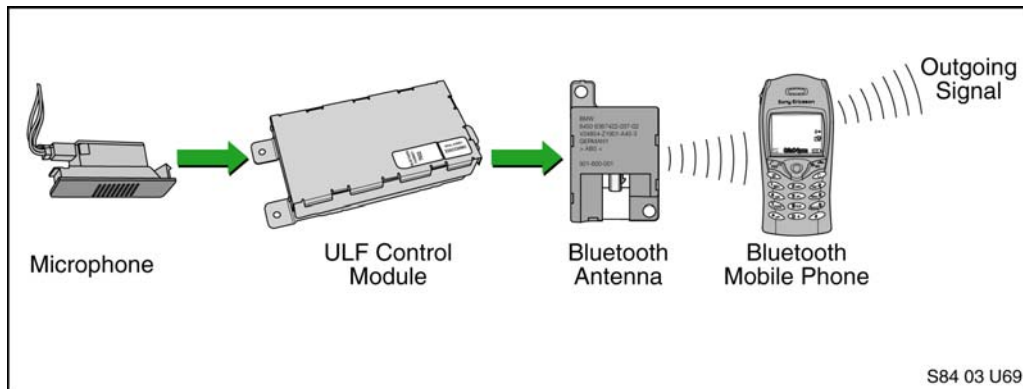
Ending a Call

The following options are available for ending a call:

3 Series without Display Screen:

- Press send/receive [icon] button on MFL (Steering Wheel)
- Press send/receive [icon] button in the center console
- Press send/receive key on mobile phone

5 Series and X5 SAV without Display Screen:

- Press send/receive [icon] button on MFL (Steering Wheel)
- Press send/receive key on radio
- Press send/receive [icon] button on the oddment tray (Center Console)
- Press send/receive key on mobile phone

Vehicles with Display Screen:

- Press send/receive [icon] button on MFL (Steering Wheel)
- Press send/receive [icon] button on the oddment tray (Center Console)
- Select the green phone symbol on the Display Screen
- Press send/receive key on mobile phone

Transfer Active Call From Phone to ULF

If a call is received or placed via the handset, it can be transferred into the vehicle once the phone is within the active Bluetooth™ network of the vehicle.

Call transfer procedure:

1. Ignition must be on.
2. Bluetooth™ connection must be established.
3. Briefly depress the send/receive button [icon] located in the center console.

13

NOTE: Some phones may automatically display a statement asking the user if the active call should be transferred to the ULF system shortly after the Bluetooth™ connection is established. If the request is acknowledged the call is automatically transferred into the vehicle/ULF system without having to depress the send/receive button

Transfer Active Call from ULF to Phone

If you are currently in an active call and you need to leave the vehicle the call can be transferred into the handset in several ways.

1. Ignition is turned off and you walk away from the vehicle. Once outside the 10 m (32.8 ft) range a message may be displayed on the phone asking if the current call should be maintained or ended, by maintaining the call it will be transferred to the handset.

2. Depending on the model of phone being used the call can be transferred to the handset by manually disconnecting from the Bluetooth™ network via the connections menu or selecting a transfer function in the settings menu of the phone (refer to the user's manual of the phone for more information).

Linking Several Bluetooth™ Mobile Phones

Up to four Bluetooth™ mobile phones can be paired one after the other to the ULF control module. The pairing operation corresponds to the procedure described above.

The handset paired last has the highest priority. The telephone paired first will drop out of the list if a fifth Bluetooth™ mobile phone is paired.

Note: For incoming and outgoing calls, only the user connected first to the system can speak via the hands-free facility.

If two users enter the network or connection range simultaneously, only the user with the highest priority (the user last paired during the initial pairing procedure) will be able to use the hands-free function for incoming & outgoing calls. If the highest priority phone is turned off the phone with the next highest priority will be connected.

Deleting Devices

The paired Bluetooth™ mobile phones can only be deleted as a single group from the ULF control module.

The pairing procedure must first be activated, and then the send/receive button on the installed eject-box or the pairing button located at the rear of the center console must again be depressed for an additional 10 seconds after the "Bluetooth Pairing" message is displayed on the radio in order to clear the list of paired devices from the control module and the message "paired devices deleted" is displayed.

Technical Information

Not only does the Universal Bluetooth™ Hands-Free System offer a means to wirelessly integrate a mobile phone into the vehicle, it also can be diagnosed using the DISplus or GT1.

The control module should always be coded to the specific vehicle that it is installed into to ensure optimum system performance. Coding of the module can be done using the DISplus or GT1 with CD33 or higher installed.

The ULF control module contains several controllers that provide the following functions:

1. Bluetooth™ Control Circuit

   The Bluetooth™ control circuit is physically connected to the Bluetooth™ antenna. It establishes the connection between the Bluetooth™ mobile phone and the vehicle, de-scrambles the incoming call/signal from the phone, scrambles the outgoing signal from the microphone for transmission to the phone, plus controls all communication to paired Bluetooth™ devices.

2. Hands-free Control Circuit

   The hands-free control circuit in the ULF controls the input/output of audio frequency signals in hands-free mode. The hands-free mode is designed for full-duplex transmission. This means the user can listen and speak simultaneously. Voice transmission takes place via a microphone located in the interior of the vehicle.

   Pressing and holding the send/receive ⬛ button until an audible beep is heard will activate the integrated voice recognition system and place the system into a hands-free mode.

3. Audio Output Control

   The incoming signal from the Bluetooth™ phone is processed, sent through the radio and to the speakers.

4. Audio Input Control

   The outgoing audio received from the vehicle microphone is processed and transmitted to the Bluetooth™ phone.

5. I/K-Bus Interface

   The interface in the ULF control module for the I/K-bus controls the procedure for transmitting and receiving data telegrams via the I/K-bus in connection with other components on the bus.

6. Power Module

The power module in the ULF control module regulates the voltage supply and monitors system shutdown in the event of an under voltage situation in the vehicle.

System Overview

S84 03 U86

Voice Recognition

The voice recognition for the this system is integrated into the ULF Control Module and utilizes the same voice commands as those used with the TEMIC Voice Recognition Module used with the CPT8000 phone system. The "Owner's Manual for the Voice Input System" P/N 84 11 0 027 942 should be referenced for more detailed information regarding voice command features.

Coding ULF Control Module to Vehicle

After installing the ULF Kit, the vehicle should be re-coded with DISPlus/GT1 SW 33 or higher, using the "Retrofit" path to ensure that the system works properly with the systems currently installed in the vehicle. The recoding is done automatically when using the following "retrofit" procedure:

Example for coding E46 with ULF installed:

- Connect DIS or GT1 to vehicle (with SW 33 or higher installed).

- Turn on ignition

- Select "Coding ZCS"

- Series: "E46 Series"

- Path: "2 Retrofit"

- System: "ULF Universal charging and Handsfree facility".

- Follow the on screen requests to activate the coding procedure.

Function Test

Upon completion of the recoding, verify that the BMW Universal Bluetooth™ Hands-Free System is working correctly by going through the following action steps. After completing each step ensure that the desired result is obtained:

Action	Response
Pair phone to vehicle (refer to section for pairing instructions).	Phone and or Radio/MID/Board Computer should display statement indicating Pairing succeeded.
Turn on radio and initiate a call using voice recognition commands by depressing/holding the Voice recognition button on steering wheel until an audible beep is heard	Radio should mute and an audible beep is heard through vehicle speakers.
Say "Dial number"	System states "Please speak the number"
Say phone number to be dialed ex"1234567890"	System states "1234567890"
If number is correct say "Dial"	Call is placed and number being dialed is displayed on phone as well as on Radio/MID/Board Computer.

Troubleshooting

Situation	Correction
No audio output through vehicle speakers	Check SES module jumper plug
Radio does not mute after placing a call	Check connections at rear of radio for Tel On and Tel Mute signal. Verify that connectors and pins are properly seated.
Audio quality in vehicle may not sound very good	Recode ULF Control Module.· NOTE: Audio quality in vehicle or at person being contacted, is dependent on the quality and signal strength of the wireless service provider in the area traveled.
Customer complains that the person being contacted hears a "Buzzing" noise, at times during their conversation or on voice mail message that he/she has left.	Intermittently a "Buzzing" noise is noticeable to the person being called from the vehicle. The "Buzzing" noise is a result of the GSM signal being feedback through the microphone, this usually occurs if the GSM phone is located too close to the microphone. The customer should change the location of where the phone is placed/stored.
Driver is told that the person being contacted complains that there is an echo/reverberation in the audio; person can hear his/her voice back through the phone.	Audio volume in vehicle during a call may be a bit to loud, causing the other person to hear his/her voice coming back through the phone.
A second call is received while in a call, and call cannot be accepted using MFL controls.	Use handset to expect second call and place previous called on hold. Call waiting is functional only via the handset.
The radio audio does not come back immediately if the "other" person hangs up first.	It takes approximately 15 seconds for the ULF system to recognize that the call was terminated from outside the vehicle.If the call is terminated from outside the vehicle first, the driver can depress the button on the steering wheel to terminate the call from the vehicle and un-mute the radio quicker.
Customer is not able to pair phone to system, not able to locate ULF passkey/password reference card.	The "BluetoothTM Passkey" is identified on the label of the ULF Control Module located in the rear of the vehicle.· The "BluetoothTM Passkey" for the installed control module can be obtained by connecting the DISPlus or GT1and accessing the diagnostics for the ULF system:- select "Diagnostic requests"- select "Bluetooth code"
Intermittently a popping noise is audible through the vehicles speaker and there is no BluetoothTM wireless communication established between the ULF module and the phone.	Vehicle and /or ULF Control Module are not correctly coded.· Recode module and vehicle (refer to Coding ULF Control Module to Vehicle)
E46 Only:After installation of ULF system the speedometer and odometer do not work.	Remove pin 7 & 8 from the 54-pin connector going to the ULF Control Module. Refer to the E46 installation instructions.

Connector Pin Assignments

The 54-pin connector of the ULF Control Module utilizes the following pins on X01185

PIN	Description
1	Microphone +
11	Cradle On/Enable
15	I-Bus
17	KL 30
19	Microphone -
21	Microphone Shield
22	Hook
27	Programming
28	Programming
32	Cradle Key +
33	Telephone On
34	Telephone On (pin 33)
35	KL R (Ignition)
36	KL 31 (Ground)
43	Programming
44	Programming
45	Programming
51	Telephone Mute
52	KL 58g (illumination)

The following pins on X4545 are utilized when the eject box is connected

PIN   Description

1   Cradle Key +
2   KL 31
3   58G
5   KL 30
13   Cradle On/Enable

Note: The pairing button used on the E46 only utilizes pin 1, 2 & 3 of X4545

ULF Wiring Schematic for the E53 with Boardmonitor

Bluetooth Antenna
X9988
X9987

ULF Control Module

X01185
15 I/K Bus
to other modules

Boardmonitor

X18801
Light Switch input 1
from terminal 30 F75 7
X18801
2 X18801
X13016

Radio Control Module

X13646
X13649 9 I/K Bus 6
X13649 10 TAPER + 7
X13646 8 TAPER + 9
X13649 2 TAPEL + 1
X13646 4 TAPEL - 2

from K3 unloader relay
16 X13646
from terminal 30 F72
15

X13016

Speaker

output to speaker

Eject Box

Light Switch input 3 X4545
from terminal 30 F74 5
X4545 19 Cradle On 13
X4545 1 Cradle Key +
2
X01041
X01185 11
+5V
X01185

Telephone Mute 51 12
Telephone On 33 23 X10390 18 11 X13649
Tel - 38 25 12 12 X13646
Tel + 37 26 13 6

SES Jumper Plug
X10390

Microphone + 1 11 9 X2759 1 X18507
Microphone - 19 10 8 3 3
Microphone Shield 21 2 2

Microphone

K3 Unloader relay terminal R
X57 35

F74 10A
30 X10018 17

X01041
38 Ground Distribution

ULF Wiring Schematic for the E53 with Multi Information Display

Bluetooth Antenna
X9988
X9987

ULF Control Module
X01185
15 I/K Bus
to other modules

Eject Box
X4545
Light Switch input
X4545
from terminal 30 F74
13 Cradle On
1 Cradle Key +
2
X01041
X01185
11
32
+5V

K3 Unloader relay terminal R
X57
35

F74 10A
30
X10018
17

Radio Control Module
X13646
16 from K3 unloader relay
15 from terminal 30 F72
9 I/K Bus
X13646
X13646
12 X13016

Multi Information Display
X10119
3 Light Switch input
8 from K3 unloader relay
2 from terminal 30 F75
1 X10119
X13016
4

Speaker
output to speaker

51 Telephone Mute
10

SES Jumper Plug
X10390
33 23 Telephone On 18
38 25 Tel - 12
37 26 Tel + 13
X10390
11
12
6
X13649

1 11 Microphone + 9 X2759 1 X18507
19 10 Microphone - 8 3 2
21 Microphone Shield 2 2

Microphone

X01041
38 Ground Distribution

21
Bluetooth™

ULF Wiring Schematic for the E39 with Boardmonitor

ULF Control Module

Bluetooth Antenna — X9988

X9987

Eject Box

Light Switch input — X4545

from terminal 30 F57

X4545

X01185

Cradle On

Cradle Key +

X01041

15 — X01185 — I/K Bus — to other modules

K3 Unloader relay terminal R — X57

F57 10A — 30 — X10018

Radio Control Module

from K3 unloader relay — 16 — X13646

from terminal 30 F56 — 15 — X13646

X13646

X10390 — X10390

Telephone Mute

Telephone On

Tel -

Tel +

SES Jumper Plug

Microphone +

Microphone -

Microphone Shield

X2759 — X18507

Microphone

X13649 — X13646

X13649 — I/K Bus — to other modules

TAPER + — X13646

TAPER -

TAPEL +

TAPEL -

X13016

Boardmonitor — X18801

Light Switch input — X18801

from terminal 30 F56

X18801 — X13016

Speaker

output to speaker

Ground Distribution — X01041

ULF Wiring Schematic for the E39 with Multi Information Display
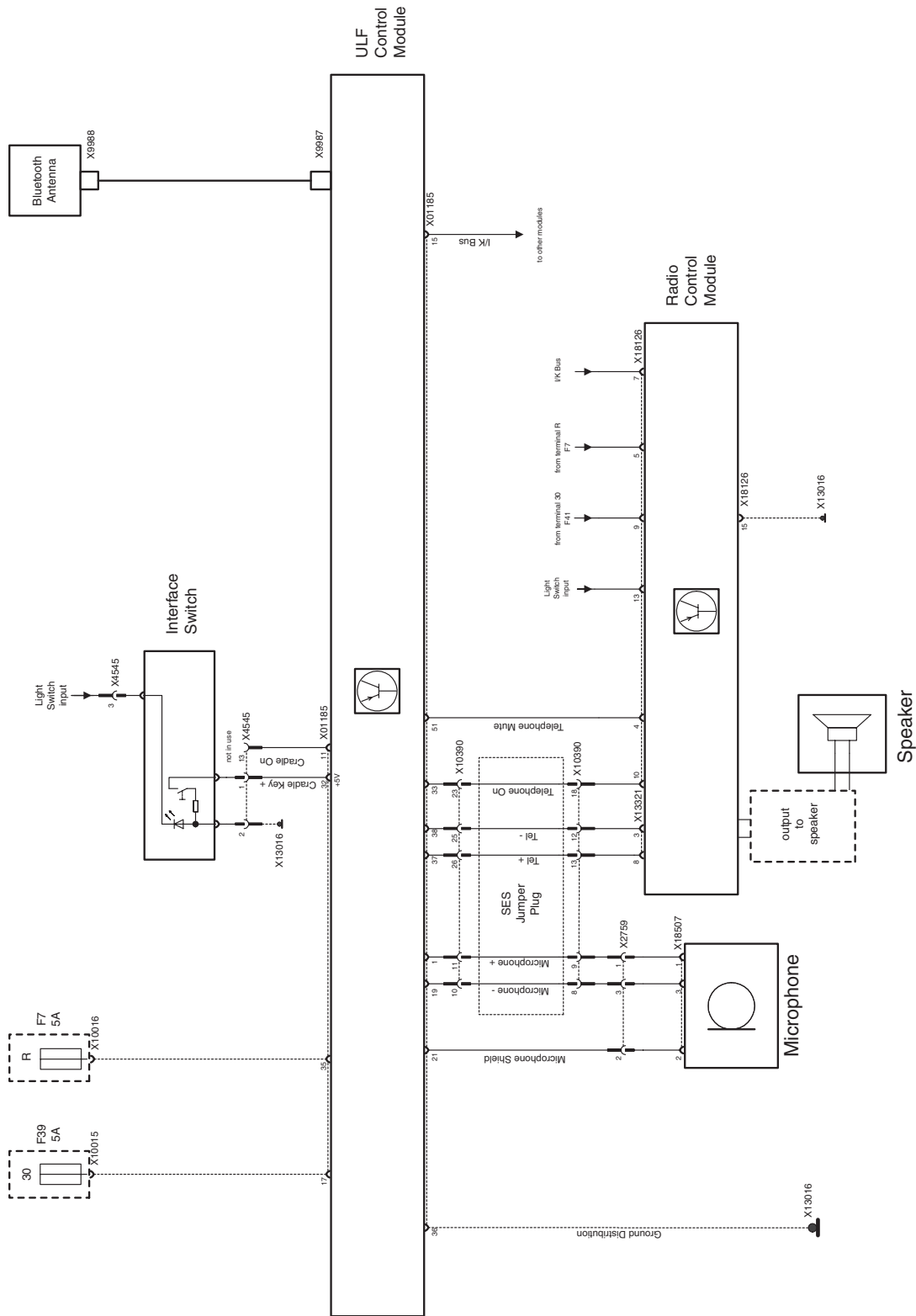
Schematic information obtained / developed using schematics from DIS v 32.0

ULF Control Module

Bluetooth Antenna — X9988

X9987

X01185

I/K Bus — to other modules

Eject Box

Light Switch input — X4545

from terminal 30 F57

X4545

Cradle On — X01185

Cradle Key + — X01041

+5V

K3 Unloader relay terminal R

X57

F57 10A

30 — X10018

Radio Control Module

from K3 unloader relay — X13646

from terminal 30 F66

X13646

I/K Bus — to other modules

9 — X13646

Telephone Mute — X10390

Telephone On — X10390

Tel - — X13649

Tel + — X13649

SES Jumper Plug

Microphone + — X2759

Microphone - — X18507

Microphone Shield

Microphone

Multi Information Display

Light Switch input — X10119

from terminal R F44

from terminal 30 F25

X10119

X596

Speaker

X13646

X13016

output to speaker

Ground Distribution

X01041

ULF Wiring Schematic for the E46 with Boardmonitor

Bluetooth Antenna — X9988

ULF Control Module — X9987

Interface Switch

Radio Control Module

Boardmonitor

Speaker

Microphone

Light Switch input — 3 — X4545

not in use — 13 — X4545
Cradle On — 11 — X01185
Cradle Key + — 32
+5V — X13016 — 2

X10390
X13649

SES Jumper Plug

Telephone Mute — 51
Telephone On — 33 — 23
Tel - — 38 — 25
Tel + — 37 — 26
Microphone + — 1
Microphone - — 19 — 10 — 11
Microphone Shield — 21

I/K Bus — 15 — X01185 — to other modules

from terminal R F7 — 16 — X13646
from terminal 30 F41 — 15

X13646

TAPER R
TAPER +
TAPEL +
TAPEL -
I/K Bus — 9 — X13649 — to other modules

X13646 — 12

Light Switch input — 1 — X18801
from terminal R F7 — 11
from terminal 30 F41 — 7

X18801 — 2 — X13016

X13016

output to speaker

X2759 — X18507

F7 5A R — X10016 — 35
F39 5A 30 — X10015 — 17

Ground Distribution — 36 — X13016

ULF Wiring Schematic for the E46 without the Boardmonitor

ULF Control Module

Bluetooth Antenna

Radio Control Module

Interface Switch

Microphone

Speaker

SES Jumper Plug